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EMERGENCY ENTOMOLOGICAL SERVICE

UNITED STATES DEPARTMENT OF AGRICULTURE.

Reporting cooperation between Federal, State, and Station
Entomologists and other Agencies.

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REPORT OF THE FEDERAL HORTICULTURAL BOARD.

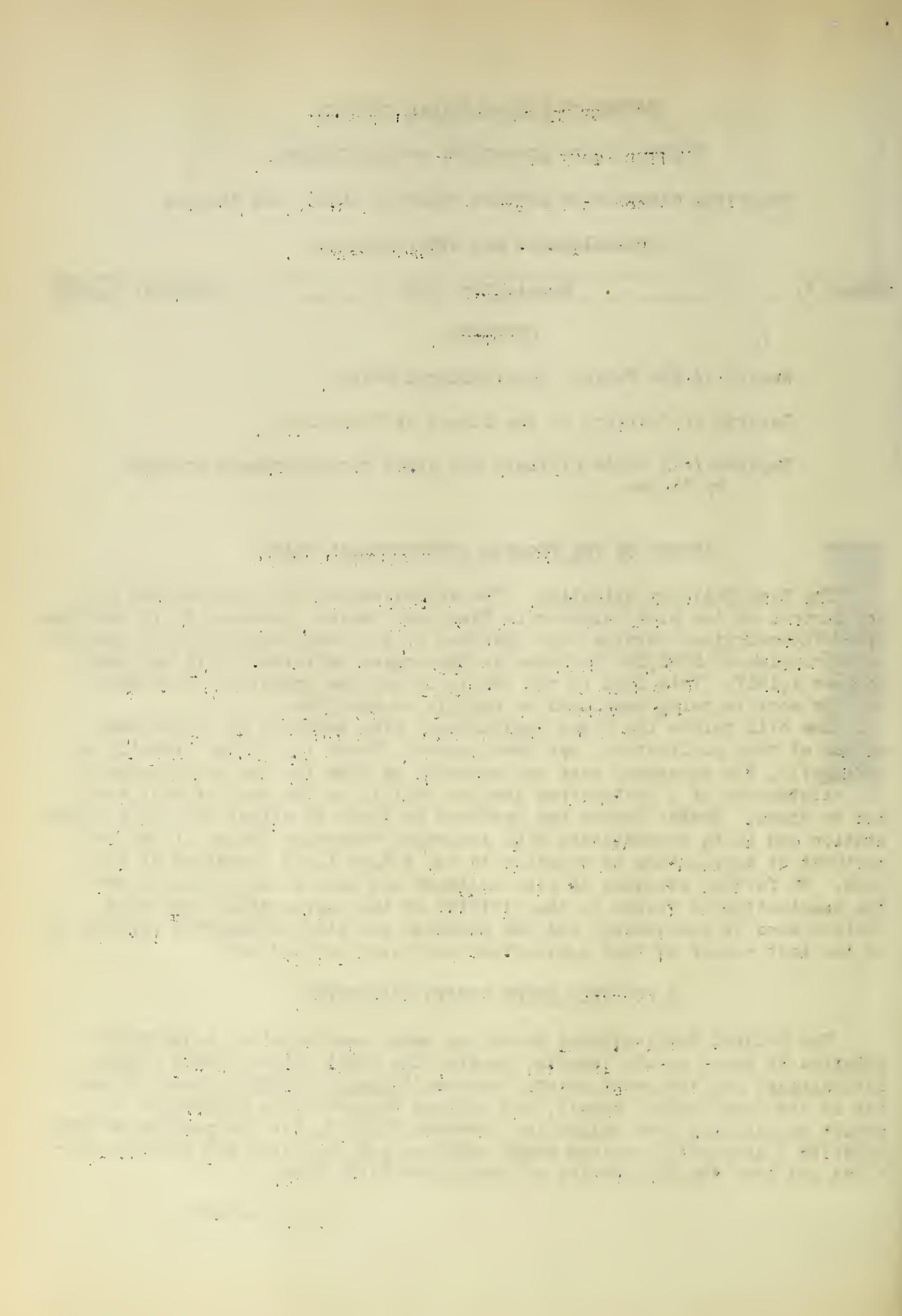
The Pink Bollworm Situation. The establishment of a cotton-free zone and control of the pink bollworm in Texas and Mexico, referred to in the Emergency Entomological Service No.6, October 1, has been supported by a special appropriation of \$250,000 included in the urgent deficiency bill approved October 6, 1917. This fund is now available and the organization to carry out the work is being developed as rapidly as possible.

The bill before the Texas Legislature, also referred to in the last number of this publication, has been passed. Under it, either directly or indirectly, the necessary work can probably be done for the establishment and maintenance of a cotton-free zone as rapidly as the need of such zone can be shown. Doctor Hunter has returned to Texas to effect the local organization and is in consultation with Assistant Secretary Ousley of the Department of Agriculture in relation to the future field direction of this work. No further evidence of pink bollworm has been found in Texas, but the examination of fields in the vicinity of the eleven mills receiving Mexican seed is continuing, and the clean-up and other safeguards referred to in the last number of this publication are being carried out.

A POSSIBLE SWEET POTATO QUARANTINE.

The Federal Horticultural Board has under consideration a quarantine relative to sweet potato insects, namely, the sweet potato weevil (Cylas formicarius) and the sweet potato Scarabee (Eucepes batatae), known to occur in the West Indies, Brazil, and various Trans-Pacific countries. A public hearing has been called for November 20, 1917, for the purpose of considering a quarantine against sweet potatoes and yams from all foreign countries and from the Territories of Hawaii and Porto Rico.

C. L. Marlatt.



REPORTS OF SECTIONS OF THE BUREAU OF ENTOMOLOGY.Southern Field Crop Insect Investigations:Cotton Boll Weevil.

The northward movement of the boll weevil was somewhat checked early in October by killing frosts although there are indications that there will still be some movement. The complete line of dispersion has not been worked out. There are indications that there may be a slight falling back in central Oklahoma and western Texas. In Texas Mr. Parman records the weevil throughout Uvalde County. Mr. Webb has found the weevil at Wichita Falls but not at Vernon where it was found last year. Most of Oklahoma has not been examined but Mr. Tucker finds the weevil at Muskogee. Mr. Tucker has worked out the Arkansas line as follows: to include all of Crawford, Franklin and Johnson Counties, parts of Newton and Searcy Counties, all of Stone and Independence Counties, and probably parts of Izard and Sharp Counties, Walnutridge in Lawrence County and Marion in Crittenden County. Mr. Tucker found the weevil in the southern part of Cross County, but there have been no records from Poinsett or Craighead Counties.

The Tennessee line has been worked out as follows by Mr. Whittington: to include all of Shelby, Fayette, and Hardeman Counties, Bemis in Madison County, Wildersville in Henderson County, Cavia in Carroll County, all of Decatur County, Mt. Pleasant in Maury County, and hence presumably all of Perry and Lewis Counties. No positive evidence was found in Marshall or Giles Counties although it is quite probable that since Mr. Whittington made his examination the weevil is in both of these counties as well as Lincoln County.

In Alabama the weevil occurs as far north as Athens in Limestone County, Huntsville in Madison County, Hymer in Jackson County.

In Georgia the line has been worked out by representatives of the Georgia State Board of Entomology. These representatives have found the weevil near Center in Walker County, seven miles east of Sommerville in Chattooga County, Pinson in Floyd County, three miles southeast of Linwood, and east of Cartersville in Bartow County, near Kennesaw in Cobb County, near Tucker and Lithonia in DeKalb County, at Porterdale and Covington in Newton County, at Shady Dale in Jasper County, in the northern part of Putnam County, near Crawfordville in Taliaferro County, near Monteith in Chatham County, Chalker in Washington County, and Louisville in Jefferson County. The remainder of the Georgia line has not been definitely worked out although it is presumed that the weevil has regained most of the territory lost early in the season which was infested last year.

Professor Conradi records the weevil from Daufuskie Island, Beaufort County, South Carolina. This is the first record of the weevil in South Carolina. Investigations are being made of the South Carolina territory adjoining the infested territory of last year in Georgia, and it is quite probable that the weevil will be recorded from other points in South Carolina before the season closes.

Mr. Newell reports that the boll weevil area in Florida now includes Citrus, Sumter, Lake, and Volusia Counties and all counties north thereof.

A complete statement of the infested territory, together with a map, will be issued as soon as all data have been received and compiled.

W.D.Pierce,
October 29, 1917.

California Cotton Conditions. Both long and short staple cotton in the Imperial Valley, California, have suffered materially since the beginning of September from the activity of sucking bugs. Three species of Hemiptera seem to be especially concerned in this work which has attracted the attention of many planters. They are the sharp-shouldered pentatomid (Euschistus impictiventris), the large, green pentatomid (Chlorochroa sayi) and the tarnished bug (Lygus pratensis).

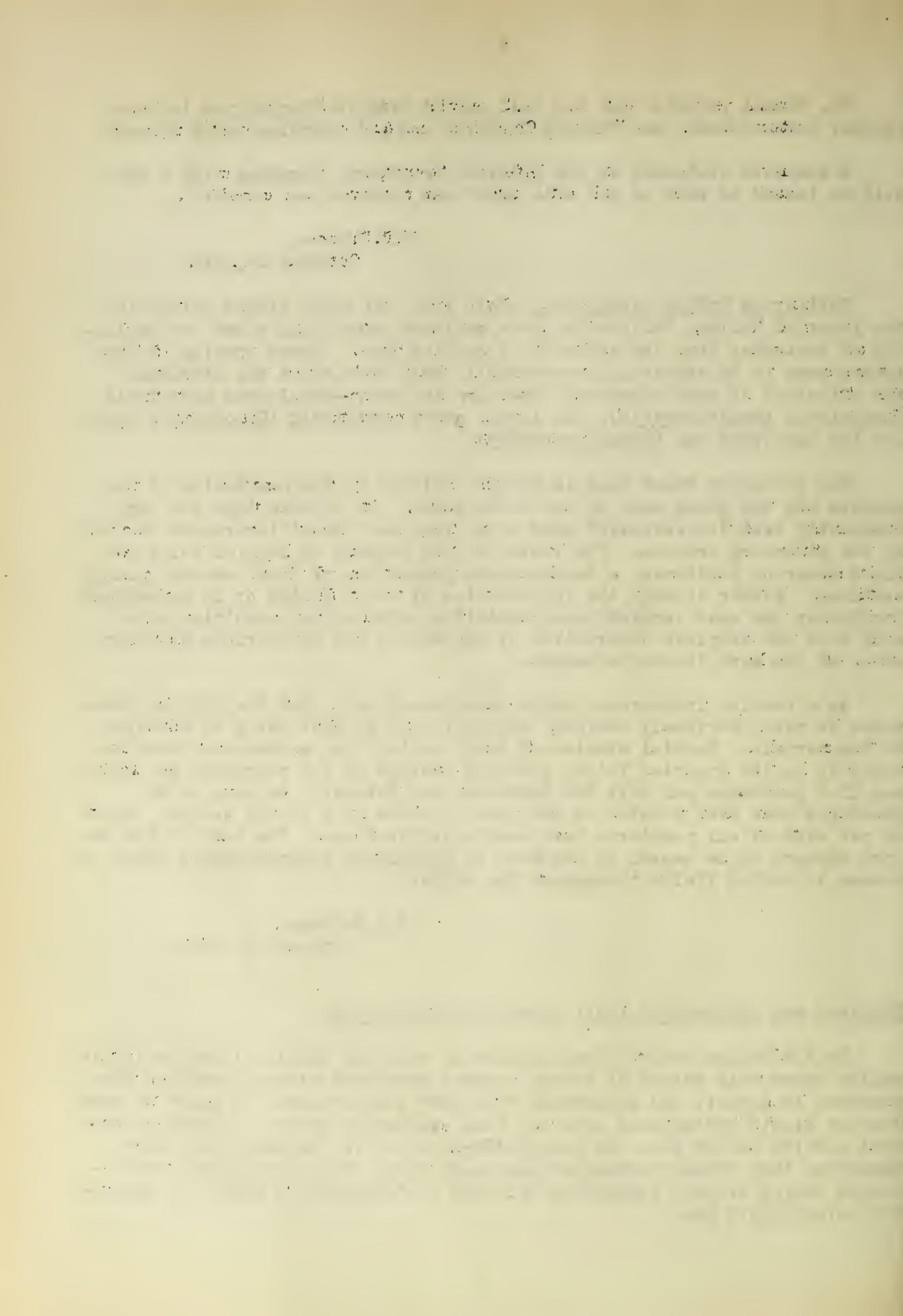
The injury by these bugs is wrought chiefly by the puncturing of the carpels and the green seed by the mouth parts. It appears that the bugs instinctly seek the succulent seed since they are almost invariably reached by the attacking insects. The inside of the carpels of injured bolls exhibit numerous punctures, a considerable proportion of which develop proliferations. Either through the introduction of toxic fluids or by mechanical irritation the seed contents soon exhibit a pathological condition which ends with the complete destruction of the embryo and the serious discoloration of the lint thereto attached.

As a result, innumerable bolls open prematurely, but the lint in these cases is weak, seriously stained, and difficult to pick owing to adhesion to the carpels. Careful studies of large series from eleven scattered localities in the Imperial Valley yield an average of 3.7 punctures per lock and 15.2 punctures per boll for September and October. As many as 60 punctures have been counted on the inner surface of a single carpel. About 28 per cent of all punctures have been proliferations. The bulk of the injury appears to be caused by the work of Euschistus impictiventris which is common in cotton fields throughout the valley.

E.A.McGregor,
October 22, 1917.

Tropical and Subtropical Fruit Insect Investigations:

Mr.R.S.Woglim reports from California that the middle of the fumigation season shows this method of insect control much more widely practiced than expected in August, and apparently with very good results. A plant to manufacture liquid hydrocyanic acid has been erected at Azusa and supplies several outfits trying this new introduction, which is, however, much more dangerous than former methods of gas generation. The first death ever recorded during orchard fumigation occurred in September at Upland on an outfit using liquid gas.



Experimental work has developed that Cryptolaemus montrouzieri, a predator of the common mealy bug, at present confined to San Diego County, California, is very effective against the citrophilus mealy bug, an increasingly alarming pest in the Upland district. Breeding of this insect and its liberation in large numbers in the citrophilus mealy bug area of Upland is being carried on with promising results. The common mealy bug is noticeably more severe in October than previously.

Mr. Yothers reports that owing to the freeze of last February in Florida there is only half a crop of citrus fruits, and but little spraying has been done, although so far as pests were concerned there is almost as much need for it as during other years. One of the principal activities of the extension work in Florida will be to overcome this indifference and to arouse interest in control by proper use of sprays.

C.L.Marlatt,
October 27, 1917.

Truck Crop Insect Investigations:

General Notes. Naturally with colder weather there has been less complaint of injury by insects in general in the North, but in the South many reports have been received during the month of October. As an example, a cutworm outbreak has been reported by Mr. Thos. H. Jones, in Louisiana.

No outbreaks of aphids have been reported as serious but in the District of Columbia all of the injurious species of aphids which are normally present are increasing in good numbers. The spinach aphid (Myzus persicae), is still the most prevalent species appearing most abundantly on cabbage and related crops. The melon aphid has disappeared on account of lack of food, and the potato aphid (Macrosiphum solanifolii), is to be found on all solanaceous plants, too late, of course, to be injurious. It is common on tomatoes.

In the early days of October the pea aphid was so numerous in the fields in Orange County, Calif., that it was found desirable to spray with nicotine sulphate.

The sweet potato weevil (Cylas formicarius), continues as the subject of discussion and many new localities have been added to an already long list of regions affected by this species in Florida, Louisiana, and Texas.

Complaints of injury by the pickle worm and melon worm have been received from several sources in Georgia.

The celery leaf-tyer (Phlyctaenia ferrugalis) was abundant in Orange County, Calif.

Work has continued until the end of the month on the striped cucumber beetle (Diabrotica vittata). Considerable progress is being made in the study of this species in different regions. It has been noted that heavy frosts and cold weather drive this species to shelter but that two days of warm weather is sufficient to bring it out again. It still occurs abundantly on the fruit of squash, pumpkin, and other curcubits remaining in the field.

Mr. Neale F. Howard reports that the common cabbage worm (Pontia rapae) was the most serious insect pest in Wisconsin during the past season.

At Wichita, Kansas, Mr. F. M. Wadley reports the corn ear-worm (Heliothis obsoleta) as having done considerable damage to fruit of tomatoes in early October. Tomatoes have been reported damaged by grasshoppers in Muscatine, Iowa, by Mr. C. E. Smith. They also did some damage to horse-radish by devouring the foliage.

The three-lined potato beetle (Lema trilineata) disappeared about the middle of October; its disappearance being gradual, some isolated individuals remaining while the bulk had disappeared.

The strawberry leaf-roller (Ancylis comptana) was injurious during the month in Illinois.

It was somewhat surprising to find that the bean ladybird (Epilachna corrupta) was presented in all stages on string beans as late as October 10. They were collected by Mr. H. O. Marsh at Pueblo, Colo. Complaints were made of severe injury by wireworms to potatoes during the year in parts of Washington State and in northern Ohio.

F. H. Chittenden,
October 29, 1917.

Insect Injury at Baton Rouge, La., and vicinity:

The black blister beetle (Epicauta pennsylvanica) has been very abundant on weeds about Baton Rouge and has been reported injurious to the foliage of Irish potato, one report coming from East Baton Rouge Parish on October 1, and another from Livingston Parish October 5. The adults have different habits from those of Epicauta lemniscata and cannot be driven as can the latter. Adults of E. pennsylvanica do not congregate in swarms, but are more or less scattered through a field. When distributed they drop to the ground and remain motionless.

While in Plaquemines Parish September 20 the writer heard of several reports of injury to germinating seed in seed beds by crickets (probably Gryllus pennsylvanicus). Seed beds are covered, after the seed is planted, oftentimes with straw, boughs, or burlap. This probably makes suitable quarters for the crickets. Some truckers reported satisfactory results by placing poisoned bran mash under the coverings.

Larvae of the semi-tropical army worm (Prodenia eridania) have caused considerable damage to the foliage of sweet potatoes, and probably other crops. Some were received from the County Agent of Livingston Parish on September 24.

Various species of worms have caused much damage to cauliflower and Brussels sprouts on the Experiment Station grounds at Baton Rouge. Autographa brassicae has been most numerous, while Pontia rapae, P. protodice and Hellula undalis have also been present. Many of the larvae of A. brassicae have been affected with what appears to be a bacterial disease.

Thos. H. Jones,
October 22, 1917.

Experiments with the Beet Leafhopper (*Eutettix tenella*). At the present time both adults and nymphs of this species are unusually abundant in the vicinity of Spreckels, Calif. Formerly it has always been quite difficult to collect any number of specimens in this locality. Dissections are now being made to obtain the percentage of parasitized individuals. Both the light summer and dark winter forms are present in the fields and it seems probable that there is an overlapping of broods and the summer and winter broods are both present. Experiments are now in progress to determine this point.

As many dissections as possible in the time available are being made daily with insects collected at King City, Calif., for the purpose of determining the percentage of parasitism for this locality. At the present time the percentage is about 44%. About 120 insects have thus far been dissected. It has been noted that quite a large percentage of individuals in storage cages were parasitized by the dryinid parasite. It seems quite evident that one or more broods of this parasite developed in these cages but they were not under observation so it is not definitely known. I am going to try and find time for some rather elaborate experiments with this parasite as well as the *Pipunculus* next season. This is the first time sufficient dryinid material has been on hand.

"Curly-top" is developing rather slowly now, due perhaps to the cooler weather we are having. A small percentage of the tests made with King City insects collected September 28 have shown virulence. Preliminary experiments have been started with the object of arranging some device to regulate the humidity and observe the effect of different conditions of humidity on the development of *Eutettix tenella*. Experiments conducted during the past season have shown more than ever that humidity must be an important factor in the life economy of this species.

C.F. Stahl,
October 15, 1917.

Bee Culture:

The Secretary has authorized the appointment of six additional men for extension work in beekeeping. The funds provided for the project are from the appropriation for miscellaneous items under the Food Production Act, which was approved by the President on August 10, 1917. The men who are to carry on this work are now being appointed and it is hoped that, even at this late date, they may be able to retrieve to some extent at least the situation brought about by the too prevalent inadequate preparation of bees for winter. This extension work will be concentrated as much as possible in the areas in which intensive work will result in an immediate increase in the production of honey. For this purpose, six groups of states have been arranged and plans are being made to assign an agent to each group. All this work is to be carried on in cooperation and through the regular extension service.

G.S. Demuth.

REPORTS FROM STATE OFFICERS AND OTHER CORRESPONDENTS
ARRANGED BY STATES.

ARKANSAS.

Reports from our district agents indicate that boll weevil damage ranges from 20 to 50 per cent in the southern part of the State. 25 per cent would be a conservative guess as to the average damage.

Owing to the earliness of the frost this year, which was three weeks ahead of time for some parts of the State, insect activities have been cut short. The only insect which has attracted much attention this month has been the cotton boll worm, Heliothis obsoleta, which seems to have been much worse this year than generally.

The number of inquiries which we have received on the control of bean weevils has been unprecedented this year. It might also be added that, during the season, we also received far more than the normal number of requests for information on garden insects. If the same is true in other southern states, this points to the fact that the corn and cotton farmer is at last taking the "feed-yourself-first" problem seriously and in so doing he is being initiated along lines of insect control in which he should have help. Assistance which entomologists can render in this connection will not only help win the war but will go a long way towards putting the South on a permanent agricultural basis.

Geo. G. Becker, Entomologist,
October 25, 1917.

CONNECTICUT.

On late cabbage, the imported cabbage worm and the cabbage looper are abundant and causing the unusual amount of injury. The turnip aphid, Aphis pseudobrassicae Davis, which injured turnips and kale in 1916, has appeared in certain sections but not in such injurious numbers as last year. The squash bug is very abundant around the old vines. The season is about over here for most insects attacking field crops.

W.E. Britton,
October 27, 1917.

FLORIDA.

I have not received many complaints of insect depredations during the past month.

Cutworms, of course, are doing the usual amount of damage.

Heliothis obsoleta is eating seeds of beggar-weed to a considerable extent, while Eudamus proteus is also eating leaves of this plant and beans as well as of late cowpeas. In fact, most legumes are being eaten by Eudamus proteus.

Anticarsia has been checked by a fungus commonly called cholera, Botrytis rileyi.

The boll weevil is reported as far south in the State as Ocala. There will be much cotton planted far south in Florida next year, due to the severe depredations of the boll weevil in infested territory, making it practically impossible to grow Sea Island cotton there. All this proposed planting in southern Florida will be Sea Island cotton.

We have received a unique complaint from Dania, from the County Agent, who reports that snails are destroying tomatoes in some sections. The species is very large, reaching a length of two inches, and has not been identified as yet.

J.R.Watson, Entomologist,
October 24, 1917.

IDAHO.

Except when night temperatures go down to 40° F. there have been large numbers of cutworm moths on the wing during early September. They represent many species, a few of which I have collected. I connect this fact with the early spring epidemic of cutworms.

In some well sprayed commercial apple orchards there has been a 5 per cent stinging of apples by second brood appleworms, since the first of September. These commercial apple orchards were given a good calyx spraying but all the other sprayings flew wide of the right time for application, since this unusual season made ineffective the usual spray calendar. Two or three reports of red humped apple tree caterpillar have been received.

A.C.Burrill, Entomologist,
September 27, 1917.

ILLINOIS.

Recent reports from my field entomologists for southern Illinois show a greater degree of infestation of wheat by the Hessian fly for that section of the State than we have heretofore anticipated. His data were collected between October 6 and 18 from ninety-nine fields scattered over ten counties in all parts of southern Illinois, and his ratios were obtained from 3290 wheat plants, most of them so young as to show but a single leaf. Twenty-two per cent of these plants were already infested by Hessian flies, nearly all in the egg stage, and the number of eggs averaged four to each infested plant. Egg-laying was still in progress when his last report was sent in.

In central and northern Illinois, on the other hand, the infestation seems, from all accounts, to be at present practically negligible.

Stephen A.Forbes,
October 24, 1917.

KANSAS.

Entomological extension work is being conducted along the following lines:

Hessian fly survey work in order to ascertain the degree of fly infestation in the old stubble fields that have been left, to plant some other crop next spring. In some localities the inspections show that in many cases from 25 to 50 per cent of the fly is still in the old stubble and very probably the flies will not emerge until next spring, at which time, if the stubble has been left undisturbed, they will emerge and infest the wheat fields. Some of these fields are also full of volunteer, some of which is infested with the fly. The farmers are urged to turn these stubble fields under this fall, and thus not only destroy the fly but also many other insects that winter over in these fields.

Destruction of grasshopper eggs. In some districts in northwestern Kansas the inspections show that the grasshoppers have deposited their eggs in the crown or roots of grasses growing along the edges of fields, roadsides, and waste places. The extension entomologist is preparing exhibition cases showing just where the eggs are deposited. These attractive cases are placed in bank windows. A neatly printed placard tells the story and gives the practical methods of control. These cases are already placed in bank windows of many of the towns. The information that the exhibition cases convey is very convincing and the farmers are carrying out the methods of control. The manual training department of the high schools are glad to cooperate and assist in making the glass top cases.

Chinchbug survey work. Since the weather is not cold enough to drive the chinchbugs into their winter quarters, inspections will be made in several counties to determine whether the chinchbug situation is serious enough to warrant the organizing of districts for cooperative burning. In the greater part of this work the extension entomologist will work in cooperation with the county agricultural agent. Very probably the districts or counties will be organized by school districts. This method has proved very successful in the past. We are also planning to prepare exhibition cases showing the favorable winter quarters of the chinchbug. These will be placed in bank windows. Practically all of the bankers are glad to cooperate in any work of this sort.

Fruit insect work. The fruit insect extension entomologist is not only visiting many orchardists, calling their attention to what can be done during the fall and winter to prevent and lessen attacks on next year's crop, but is also giving lectures at the farmers' institutes on fruit insect control. This work is well received by the orchardists.

Geo.A.Dean,

October 23, 1917.

LOUISIANA.

The sweet potato weevil (*Cylas formicarius*) has been reported from a number of parishes, and it is doing considerable damage especially along the coastal region. In some cases the acreage planted to sweet potatoes has been cut down very greatly on account of the presence of this pest.

1820. 10. 10. -
The weather is very bad. It is raining hard and there is a strong wind. The water level in the river is rising rapidly. The ground is becoming saturated and there is a risk of flooding. The people in the area are preparing for the worst. They are moving their belongings to higher ground and securing their houses. The authorities are monitoring the situation closely and have issued warnings to the public. The forecast is for more rain and wind throughout the day. The situation is being closely monitored by the emergency services.

The aid of the county demonstration agents has been enlisted in reporting the occurrence of this weevil, and in discouraging the planting of seed potatoes and slips from infested fields, as well as the non-rotation of the potato crops.

E.R.Jones,
October 25, 1917.

Since my last communication there has been comparatively little new in the way of noticeably destructive insects to note. Hyphantria cunea (or textor) has again developed in great numbers. Imagoes were noted on August 29 in sparse numbers, gradually increasing until September 13, although many were found depositing on the 18th. During the following few days there were many reports of larval depredations. Reports from the east side of Lake Pontchartrain showed that the new brood were in quite as great numbers as that of July. On the 16th and 17th swarms were blown into the Lake and passengers experienced great inconvenience on the pleasure steamer on the 16th. Municipal spraying has been active; all trees previously sprayed in July receiving a second dose of arsenate of lead.

Icerya purchasi has been noted for the first time during the present visitation on the west bank of the Mississippi. The scale was accompanied by the lady-beetle, Novius cardinalis, its presence proving that the beetle had flown across the river, or over a mile from the nearest installation of the beetle.

The larvae of a species of Sphinx moth, probably Protoparce sexta, has done some damage to egg-plants and the same insect seems to be responsible for injury to the Amur River privet hedges. This diagnosis is given from householders' descriptions and the exact cause has not come under my own observation.

There seems to be some increase in the barnacle scales, Ceroplastes cirripediformis and C.floridensis, the former doing some damage to green-house chrysanthemums.

In my last communication I omitted to note the marked increase of Rhizopertha dominica and D.navale in stored rice. The former insect also attacks the soybean. Observations would seem to show that it is fast overlapping the rice weevil (Calandra oryzae) as a destructive factor in stored products.

Fall potatoes, in some instances, have been completely destroyed by Doryphora 10-lineata and the twelve spotted Diabrotica has also proved mischievous.

The lace bug noted in the last number as "Coryphuta" should read "Cory-thuca". The species mainly doing damage is C.marmorata Uhler.

Ed. Foster,
September 29, 1917.

In the way of an addendum to my communication of September 29, webs of Hyphantria cunea (or textor) persisted in a few instances until October 18, the larvae being of the third instar and the trees noted being persimmon and pecan. The visitation of this Fall Web Worm during the first two weeks of July has not been an unmixed evil. Plans are now under way for systematic spraying of shade trees along the streets and in the public parks. Private individuals have also seen the advisability of this course, and now that it has been brought home to the citizen the result of the ravages of the insect, there is more disposition to heed warnings of the entomologist.

At least four instances have come under the writer's notice during the present month where the crop of chrysanthemums has been practically destroyed by the so-called "white ant", Leucotermes flavipes. As usual, the damage had already been done before the owners asked assistance.

The palm weevils, Rhyncophorus palmarum and R.cruentatus have been responsible for quite a deal of damage of late, the principal palm attacked being Phoenix canariensis. Many large trees have had to be sacrificed. The same weevils have also done some damage to Washingtonias, and in a smaller degree to Phoenix sylvestris, the "toddy" palm. Some damage to P.canariensis by the "saddle back" (Sibine stimulea). The damage could have been lessened if it were not for the fear of "getting stung". There is a strong prejudice here against handling this larva.

Ed. Foster,
October 26, 1917.

MAINE.

October has brought no important garden produce complaints against insects. It is now rather late for trouble in Maine.

Garden slugs have done considerable damage to potatoes this season. Judging from local observation and by specimens sent to us, the potato is by far the greatest sufferer this fall. In one garden near Orono, slugs were present in every hill dug, often six or eight of the slimy things attacking a single tuber. They were underground late in August for two evident purposes, - that of feeding upon the potatoes and that of egg-laying. Potatoes similarly affected have been received from various localities during September and October, accompanied by the same culprit.

Fir trees (Abies balsamea) at Seal Harbor and vicinity have shown swollen joints in the tender growth this season evidently due to attack by Chermes piceae. The affected trees have a rheumatic appearance which seems to be typical of the work of this insect when the tender growth is attacked.

The Phycitid, Dioryctria abietella, has worked considerably in white pine in York County. No larvae were received but specimens of work showing tunnels of a lepidopter and containing pupal cases identified by courtesy of the Bureau of Entomology by Mr.C.Heinrich, were sent in during September.

Edith M.Patch, Entomologist,
October 24, 1917.

MASSACHUSETTS.

We had quite a severe frost September 11 and 12, much more severe than the ordinary first frost, and all corn was largely damaged and other crops were injured to quite an extent. Nothing has come to my attention since that time to indicate anything except that the insects are going into winter quarters and doing little damage. In other words, the entomological season in Massachusetts has come practically to an end about two weeks earlier this year than previous years.

H.T.Fernald,
October 23, 1917.

MICHIGAN.

A very bad infestation of the Rose Midge, Neocerata rhodophaga, is well established and doing serious damage in rose houses at Mt.Clemens. They apparently received it from the houses of Mr.Reinberg of Chicago. The Mt.Clemens growers are doing what they can with nicotine but are not getting ahead, and I would be more than glad to receive any advice as to what is best to be done.

Trouble is also caused by a gooseberry aphid, Macrosiphum cynosbati. Mr.Wiltberger, of this department, has been studying the creature during the past year and has gained a little additional information in regard to it. It is known as the Houghton Gooseberry Aphid. Its work on gooseberry results in deforming the bush quite seriously and interfering with the production of fruit. Spraying experiments this year fail to check the louse but we hope to do better next year by changing the time of application. The difficulty was quite common this year on Houghton gooseberry in several parts of the State.

Owing to small numbers of Hessian flies present in Michigan just now, we have advised the seeding of fall wheat a little bit earlier than has been the regular practice. The difficulty here has been that the farmers believed that if late sowing was good, then the very latest sowing would be better, and instead of seeding along about the 20th of September they have been seeding about the 20th of October in many cases. I saw fields yesterday where the wheat had not yet appeared above the ground, and the weather has turned cold so that it seems as if the warm weather is about over. One dreads to advise earlier seeding because the farmers will almost certainly keep on seeding earlier and earlier until we get another outbreak of the fly, but we have taken the chance in the emergency as a sort of war measure, in order to insure a good crop of wheat next year.

R.H.Pettit,
October 24, 1917.

MISSISSIPPI.

During the month of September we have received many complaints in regard to insects affecting garden and truck crops. Flea beetles were reported seriously damaging Irish potatoes at several points in southern Mississippi. The semi-tropical army worm, Prodenia eridania, was reported

from a number of places. At some points it did considerable damage. I believe there is no doubt but that it is the most serious sweet potato pest that has affected the sweet potatoes in this State this year. We are receiving an unusual number of complaints in regard to the Harlequin cabbage bug, Murgantia histrionica.

R.W.Harned, Entomologist,
September 29, 1917.

MISSOURI.

During the present month, previous to the killing frosts, additional opportunity of noting the abundance of grasshoppers and the extent of their injury to pastures, cereal and forage crops, as well as to late vegetables and fruit trees, leads us to look forward to important grasshopper troubles next year. The grasshopper infestations this year have been quite general and in places they have stripped portions of early wheat and rye. They have been more abundant than usual and will receive special attention by the extension man working with forage and cereal crop pests.

Our Hessian fly work during the month shows considerable infestation in some of the west central counties and in places much wheat was seeded early. Fortunately, however, throughout most of the wheat belt of the State our observations on the relative abundance of flax seeds in the stubble during the past two months leads us to anticipate no very important Hessian fly damage for the next crop.

The extent of chinchbug infestation this year has been quite general through the central counties of the State, but the infestations have been light enough to cause no very serious damage, but our plans are to cover the section of the State where the pests seem most threatening, with a view of securing the cooperation of the farmers in treating hibernating places and in opening up all waste places for cropping purposes next year. During the year the farmers have done much toward the preparation of waste places for next year's crops, and with anything like normal seasons and with the continued cooperation of our farmers we shall expect to keep the chinchbug under control.

The fruit insects have been well controlled by fruit growers practicing careful spraying, but we have lots of inferior fruit, even where efforts were made to spray the orchards. The unfavorable season for spraying during the past spring has helped to defeat and prevent fruit growers from getting the best results.

Of the vegetable pests the plant lice, potato beetles, cabbage worms and squash bugs need special attention during the winter and spring, as they have been extremely abundant and widely distributed throughout the State this year. With the increased acreage under cultivation of truck crops, handled by inexperienced men and children no particular effort was made to control vegetable pests, which to a large extent helped to increase the abundance of vegetable insect pests.

L.Haseman, Entomologist,
October 24, 1917.

I am glad to receive your kind letter. I have been very busy with my work and have not had time to write you. I hope you will excuse me for not replying sooner. I am sorry to hear that you are not well. Please take care of yourself.

Yours truly,
John Smith

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I am sorry to hear that you are not well. Please take care of yourself. I hope you will recover soon. I am sending you some medicine to help you feel better. Please take it as directed on the bottle. If you do not feel better after taking it, please call me or go to the doctor. Thank you for your letter. I hope to hear from you again soon.

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NEBRASKA.

While the most active portion of the season of entomological effort is now past, the forces of the Nebraska entomological department are finding considerable to do in the control of stored grain pests, which are giving at least the usual amount of trouble this year, and in scouting surveys to determine centers of threatened injury by the Hessian fly, grasshoppers and other more important insects.

For the use of those entomologists who will have grasshoppers to fight next year, it will probably be well to announce at this time a rather important point concerning the poisoning of these insects, which was worked out by Mr.C.E.Mickel and the writer, in fighting grasshoppers last summer. In using the regular bran-mash formula, composed of 25 pounds of bran, 1 pound of arsenic or Paris green, $\frac{1}{2}$ gallon of molasses, and 6 lemons, we found that this formula cost about \$1.75 at current prices in western Nebraska. Where this was put out in large amounts, it ran up into money very quickly, so a number of cheaper substitutes were tested out. We found that by using 15 pounds of alfalfa meal and 10 ounces of Paris green, at the same time increasing the molasses to 1 gallon and the water to 6 gallons, while reducing the number of lemons to 3, we were able to obtain the same bulk of poison mixture at a cost of only \$1.00 or thereabouts at current prices, and that this formula was fully the equal, if not the superior, of the bran-mash formula, at least in that region. This, of course, meant a great saving in the expense of fighting grasshoppers, and induced many farmers to fight the pest much more energetically than they would if the more expensive bran-mash formula were used. The molasses used was the cattle molasses obtained at the beet sugar factory, and which sold at about five cents per gallon. Alfalfa meal has so much greater swelling power when plenty of water is added that the 15 pounds makes approximately the same amount of poison mixture as 25 pounds of bran. We should be glad to learn of the results of applications of this alfalfa meal mixture in other localities where grasshoppers must be fought next year.

Myron H. Swenk,
October 25, 1917.

NORTH CAROLINA.

Inquiries regarding the "weevils" in corn, wheat, peas and beans have been most numerous, reflecting an anxiety to protect the crops produced from possible loss. Next in frequency of complaint have been cabbage worms and turnip aphis. The epidemic of red spider on cotton has subsided with the coming of rains, cooler weather, and the advance of the season. Curiously enough the red spider has its "belt" of geographical distribution in this State and does not seem to be serious in all of our cotton area, although doubtless present throughout.

Franklin Sherman, Jr., Entomologist,
September 30, 1917.

Through the press we have called attention to the posters on "Safest Dates for Sowing Winter Wheat" which were sent from Washington to county agents, and have calculated the dates for farmers who were in doubt. The dates thus derived seem to fit well with best experience.

Our exhibit at State Fair included: Hessian fly poster with offer to calculate dates, comparative exhibit of sprayed and unsprayed apples, sprayed and unsprayed potatoes with data from experimental tests showing a gain of 104 bushels per acre by spraying in 1917, cabbage dusted to protect it from worms, and untreated, demonstrations with living swarm of bees in cage, and other features.

As a preparation for the work of the emergency agents of the Bureau we have circularized the county agents, asking for names and addresses of farmers with whom there will be best chance to do effective work in the different specialized fields. Replies are now coming in, and these lists will form a basis for visits in the counties. We are ready to route the men.

In beekeeping extension we are inquiring into the number of bees kept and amounts of honey produced in a certain honey-section, with the object of finding what other similar localities might have produced, and to calculate the amount of honey now being left ungathered. A conservative preliminary estimate is that over 100 tons of nectar was lost in eastern North Carolina this year, even though that section produced more honey than usual.

A Suggestion. In view of the fact that the emergency work will increase the demand for standard insecticide materials, it would seem that the Bureau agents might well devote some of their time to persuading and helping at least one representative merchant in each fruit and truck center to lay in a proper stock of insecticides. In this State several of the standard materials are available only by ordering from a distance. Same will apply to spraying outfits. We could keep a list and refer inquirers to the nearest merchant, and thus we might establish a far more common knowledge and use of proper insecticides and spray machinery. The direct immediate personal help that these agents can give to farmers is important, but it is of equal or greater value to put the public more closely in touch with the Bureau and the State officials, to encourage closer study of the publications, and to make it easier to get needed materials, for these things will make for better permanent practice.

Franklin Sherman, Jr.,
October 20, 1917.

OHIO.

No general scourge of insects occurred anywhere in Ohio during the fall but a number of species were more plentiful than usual. The Fall Web Worm, the Yellow-necked Caterpillar, the Walnut Datana, the Red-humped Apple Worm, the Hickory Tussock Moth and the Saddleback Caterpillar were much more numerous than usual and the distribution of all of them seemed to be state-wide. Some apprehension was expressed by one correspondent lest the dead remains of saddleback caterpillars on corn fodder would prove injurious to cattle. Various caterpillars, including some of the species just named, were conspicuous in the forests of southern Ohio, especially in Lawrence

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County, where Halesidota tessellata stripped away fifty or more per cent of the foliage on sycamores and other forest trees. These same caterpillars were abundant in the same districts last year; the residents in the infested area report that they were more abundant last year and this year than at any time before for ten or a dozen years.

Grasshoppers were locally severe at the Hamilton County Experiment Farm, and were reported as cutting the twine from wheat bundles at Wilmington, Ohio; at Kensington, Ohio, two acres of fall wheat was eaten off by them. They were generally plentiful throughout the State and doubtless concentrated on small areas in many neighborhoods from which we have received no reports.

Cabbage worms probably did more damage than usual, the imported cabbage worm and the Cabbage Plutella being among the chief offenders; the cross-striped cabbage worm, Evergestis rimosalis, was observed at Steele in southern Ohio. The tomato worm, Phlegethonius sexta, was observed to be quite abundant in some tomato patches at Wooster.

The green soldier bug, Nezara hilaris, has been observed to occur in large numbers at Wooster and over considerable areas in southern Ohio. It was reported injuring lima beans at McConnelsville; we infer that it occurs in considerable numbers over most of the State.

Aphids are apparently abundant and if weather conditions next spring are favorable to their development we may need to make a special fight against them. The green and pink potato aphid can be readily found on various food plants at many different points of the State. We believe it to be distributed everywhere and that the conditions we have observed at Wooster and in southern Ohio are general for the whole State. The peach aphid, Myzus persicae, was found on potato at Canton, Liberty Center, Batavia, Celina and Cleveland. The corn leaf aphid, A. maidis, was reported from many different points. The various orchard aphids are noted in numbers migrating to orchard trees.

San Jose Scale has been relatively inconspicuous all season, perhaps due to ice storms last winter; but few living scales could be found in the spring, and in only occasional instances have they multiplied during the summer to a threatening degree.

The records taken on the apple harvest indicate a somewhat higher percentage of codling worm injury and of plum Curculio injury than for several years. Frequent rains in July interfered to some extent with a proper timing of the applications; also, the excessive rainfall doubtless removed much of the poison from the fruits and foliage. Therefore, these insects were somewhat more plentiful than usual, even in the best sprayed orchards.

The prolonged drought in the fall of the year caused considerable delay in the seeding of wheat, so there are a good many late sown fields. These fields will invite attack from the wheat jointworm, but, all things considered, the State has put in a large acreage and on the average at the most favorable dates possible.

The grapeberry worm was very destructive in unsprayed vineyards, but owing to the good work done by Mr. Ingerson of the Bureau of Entomology in the principal grape centers of northern Ohio, the State as a whole has a cleaner crop than for many years.

The Hairy Fungus Beetle, Typhaea fumata, was reported injuring stored wheat at Houston, Ohio.

By means of Press Bulletins, we have encouraged fumigation of stored grains, beans, peas, and other food products; and have also encouraged fall spraying for scale insects, believing that the quicker this work is done under present conditions the more certain we will be to save our orchards and crops next year.

H.A. Gossard, Entomologist,
October 25, 1917.

PENNSYLVANIA.

With the issuance, through newspaper publicity, of recommendations for an autumn "clean-up" of crop remnants, and fall plowing as preventive of much damage next year, we are closing an unusually busy season. Gardens planted on every hand by people unaccustomed to such facilities for observation of insect damage have caused a flood of inquiries to pour into this office. It is safe to say that over one thousand inquiries per week were answered during the busy season, through this office and the twenty-two field men, who were constantly at work in designated sections of the State.

In addition to the exceptional abundance of the potato aphid, and various stalk borers in various types of plants, the usual crop pests were in abundance, causing much aggregate loss.

During the fifteen weeks of the growing season concise pointed and timely "crop pest letters" were prepared for daily publication, and mailed in weekly instalments to our State papers, by means of our "Agricultural Press Bulletin." These letters were reproduced quite generally throughout the State, and no doubt reached hundreds of thousands of readers. Considering the minimum cost, the results obtained were gratifying, and more general than could have been attained by bulletin distribution.

War Garden Crop Remnants. If conditions are favorable for insect multiplication next spring, we may expect an unusually heavy infestation of those pests which are favored by overwintering crop remnants. Unfortunately, those plots which were donated by property owners for use as temporary "war gardens" are being very generally neglected at this season, and much material in the form of crop remnants will undoubtedly overwinter, thus favoring the rapid multiplication of certain types of insect pests next year.

The nursery inspection in Pennsylvania has been entirely changed, and greatly improved over anything previously undertaken. The majority of the more important nurseries are receiving two or more inspections during the summer, and considerable effort will be made to clean up nursery premises and those premises immediately adjoining nurseries, from which the nurseries generally become infested. Under the new law all nurserymen, dealers

and agents must secure a certificate from this office. We hope to eliminate much of the undesirable agent-canvassing by this method.

The Angoumois grain moth has been carefully studied as to its biology and habits, by Mr. J. L. King, stationed for the summer at York, Pa. Some interesting features have been brought out, along with the determination of the number of broods appearing in the open and in stored grain in barns.

Insects affecting mills have been receiving additional attention through Mr. W. H. Goodwin, who will continue this work as opportunity affords.

An intense study of forest insects is under way, in charge of Mr. Josef N. Knull and Mr. Harry B. Kirk.

J. G. Sanders,
October 25, 1917.

PORTO RICO.

We are now having one of the semi-annual flights of the Dynastid, Dyscinetus trachypygus. The beetles are causing considerable damage to the cane in some sections, by their feeding on the roots and stalks of young cane.

Infestation by the sugar cane moth stalk borer is rather heavy in some sections this season, especially where the trash was burned the previous season. Weather conditions have been very favorable for the growth of the Isaria fungus that attacks the larvae of the borer, and it is doing excellent service.

The Horn-fly is rather bad on the south side and is apparently spreading to all parts of the Island. Efforts are being made to get the people to fight this pest.

The apple leafhopper Empoasca mali has been very destructive this season, attacking most vegetable crops.

Laphygma frugiperda has also been very abundant, and has caused great damage to corn, few plants escaping its attack.

Richard T. Cotton,
September 29, 1917.

Many complaints have been received about the cane beetles, Phyllophaga portoricensis and P. vandinei. They are more abundant this year than ever. Circular letters have been sent to cane growers in all sections of the Island asking for information regarding the relative abundance of white grubs, the amount and type of damage and the methods if any that are used to fight them. A great many replies have been made and much valuable information has been obtained. Two articles on the white grubs have recently been published by this station and a third is being prepared.

The egg-plant lace bug, Corythaica monacha is very abundant just now and is reported as doing considerable damage to the egg-plant in some sections of the Island.

The slug or lapa, Veronicella sp. has been reported to be causing great damage to beans and other truck crops. Collecting the slugs at night is very effective in controlling them.

Considerable damage is being caused by the plant louse, Rhopalosiphum persicae, which attacks both egg-plant and peppers.

Several reports have been received of injury by the "Fire ant" Solenopsis geminata. This ant girdles the new growth of citrus trees and is occasionally troublesome in cane fields.

Richard T.Cotton,
October 17, 1917.

TEXAS.

I have just received serious bollworm reports from Denton, Corsicana, Manor, New Braunfels, Pearsal, Seguin, but the heavy frost has evidently put a stop to their depredations. I am advising early fall plowing and occasional discing through the winter for the destruction of these insects. Bollworms were very serious throughout the cotton belt this season and if nothing is done in the way of destruction we may expect very wormy corn next spring and summer.

Boll weevils are very scarce with the exception of a few fields around New Braunfels. At that place as many as eight weevils have been found in one boll. I have recommended the grazing of fields where boll weevils are present, and where such is not possible I have advised the farmers to cut the stalks as soon as possible after the last picking and to plow them under.

Ernest E.Scholl,
Chief Entomologist,
October 26, 1917.

VIRGINIA.

We have had very serious outbreaks of the southern tobacco worm on tomatoes. Several large plantings have been practically destroyed during the past month. During the summer the heavy rains which occurred in eastern Virginia greatly reduced the usual early fall infestation of aphids. At present, however, the weather is favorable for them, and early spinach is being quite severely injured by their attacks.

L.B.Smith,
October 26, 1917.

the first time in the history of the world, the
whole of the human race has been gathered
together in one place.

The first thing that strikes us is the
immensity of the crowd. It is impossible to
conceive of anything more vast than this.

The second thing that strikes us is the
order and regularity with which the people
are arranged.

The third thing that strikes us is the
silence and quietness with which the people
are gathered together.

The fourth thing that strikes us is the
light and airy atmosphere in which the people
are gathered together.

The fifth thing that strikes us is the
beauty and grandeur of the scene.

The sixth thing that strikes us is the
importance and significance of the occasion.

The seventh thing that strikes us is the
unity and brotherhood of all the people
gathered together.

The eighth thing that strikes us is the
sense of responsibility and duty that
prevails among all the people.

The ninth thing that strikes us is the
sense of awe and reverence that
prevails among all the people.

The tenth thing that strikes us is the
sense of hope and expectation that
prevails among all the people.

The eleventh thing that strikes us is the
sense of joy and happiness that
prevails among all the people.

The twelfth thing that strikes us is the
sense of peace and tranquility that
prevails among all the people.

The thirteenth thing that strikes us is the
sense of love and affection that
prevails among all the people.

The fourteenth thing that strikes us is the
sense of sacrifice and self-sacrifice that
prevails among all the people.

The fifteenth thing that strikes us is the
sense of humility and reverence that
prevails among all the people.

DELAYED REPORTS.Extension Service:

During the last month project agreements for extension work in entomology have been approved by the following States:

Alabama	New Jersey
Arkansas	New York
Indiana	North Carolina
Louisiana	Oklahoma
Maryland	Tennessee
Mississippi	Utah
New Hampshire	Virginia

Projects have also been submitted during the month to -

Arizona	North Dakota
Idaho	Oregon
Iowa	South Dakota
Texas	

The Hessian fly campaign is now well under way and deciduous fruit extension workers are working in the southern Appalachian apple section, in Kansas, and in the lower Mississippi River region. The truck extension men in the Middle Atlantic States are closing up their work and will be moved South early next month to reinforce the work now going on in the Carolinas. Truck extension work in the lower Mississippi region is well under way with two extension entomologists at work in Louisiana and two in Eastern Texas. Truck extension work is also being carried on in Southern California.

Material progress is being made on the citrus fruit extension work in lower California, great interest being shown in the work in the control of the citrus mealy bug. One of the most important factors in this work is the control of the Argentine ant. The ants serve as nurses and distributors of the mealy bugs. The citrus work in Florida is now well established.

J.A. Hyslop,
October 30, 1917.

MARYLAND.

A campaign against the losses from stored product insects and rodents is under way. Demonstrations and lectures on farms and before farmers' organizations, and, where there is a demand, actual superintendence of the fumigation of barns, warehouses and mills is the plan being followed.

It may be noted that the terrapin scale, *Eulecanium nigrofasciatum*, appears to be on the increase in every section of the State from which had previously been recorded.

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In the Apicultural work an effort is being made to bring about the adoption of some method of winter protection for bees. Weak colonies each year are, in a large measure, responsible for the present low average colony yields. Cooperative demonstrations of the methods and value of winter packing and protection are now being instituted in various parts of the State. It is hoped that this may lead to a gradual adoption of these important measures by the better beekeepers.

Ernest N.Cory,
October 29, 1917.

MONTANA.

We are left in doubt as to whether grasshoppers will be very injurious in Montana next season. In the western part of the State where considerable damage was done this season we were unable to get evidence of egg-laying this fall, though the adult grasshoppers were abundant. Sarcophagid flies certainly did much good. In other parts of the State, isolated localities reported grasshoppers in abundance and it is thought likely that in some of these places damage will be done next season, and it is not at all certain that eggs were not laid in quantity in Western Montana in remote valleys or mountainous regions.

We are already taking steps to have a supply of arsenicals for next year for spraying orchards, potatoes, sugar beets and cabbages.

R.A.Cooley,
October 26, 1917.

NEVADA.

The season of 1917 in Nevada has been marked by an unusual lack of insect injury to the principal crops grown. Aphids did not become abundant at any time during the summer, the injury to alfalfa due to Macrosiphum creeli which had occurred here and there in western Nevada for several years was almost wholly absent. Cutworm injuries to alfalfa were not reported. No injuries to either wheat or potatoes were called to our attention, or came under observation.

We received a great many reports early in the summer of injuries to home gardens by cutworms, Peridromia saucia et al.; and maggot injuries to cabbage, beans, and onion were reported from a number of home gardens. Dr.P.A.Lehenbauer, of the Department of Biology, University of Nevada, acted as a special field agent for the Station during June and July. He made a large number of visits to home gardens and took an active part in teaching householders how to control the insects mentioned. The growing season in Nevada is now ended, and the loss due to insect depredations has been gratifyingly small.

S.B.Doten,
October 25, 1917.

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